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Search for extragalactic astrophysical counterparts of IceCube neutrino events

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Detection of 35 very high-energy (VHE) neutrinos by the IceCube Neutrino Observatory has opened a new chapter in multi-messenger astronomy. Due to large errors in measuring the directions of the neutrino shower-type events, which dominate the current event list, it is difficult to identify their astrophysical sources. We perform cross-correlation study of IceCube neutrino events with extragalactic candidate sources using X-ray and gamma-ray selected source catalogues such as Swift-BAT, 3LAC and TeV-Cat. We apply different cuts on the X-ray and gamma-ray fluxes of the sources in these catalogues, and use different source classes in order to study correlation. We use invariant statistic and Monte Carlo simulations to evaluate statistical significance of any correlation. Finally we study physical scenario in which VHE neutrinos can be produced at the candidate sources.

Collaboration

– not specified –

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